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### **How PHIN Improves Public Health Functions**

**It's a pleasure and an honor for me to be here today on this agenda. My excitement is fueled by the coalescence of factors:**

- 1) the heightened recognition of the critical role of public health in protecting our lives**
- 2) the radical developments in information technology that beg to be put to the service of our public health enterprise**
- 3) the recent allocation of resources and personnel necessary for the overhaul of our enterprise**

**All of this makes these times special, the kind of moment that happens about once every generation. I've been thrilled to be a part of this task, and especially to be associated with so many in this audience in developing new tools and new ways of doing the business of public health.**

**I have two projects to discuss with you today, which for me are terribly critical to the work of public health. These two projects are our disease/health event surveillance/tracking system: NEDSS, and our Health Alert Network messaging system.**

**Before I share with you our work, I need to say that I'm humbled to present in front of a number of colleagues who are independently deploying systems similar to ours. I look forward to learning more about such developments from colleagues in Missouri, Wisconsin, Washington, New York, Colorado, Kansas, Florida, Ohio, etc. throughout the course of this meeting. Any of these programs could be presenting how PHIN improves their public health functions.**

**Of the two projects I'd like to speak to:**

**In many ways these are quite different in structure and function: they move information in opposite directions. Our HAN addresses the delivery/sending of information out to key public health partners. Our disease surveillance/tracking efforts address the collecting of information (surveillance/tracking) from sources outside our agencies. Each needed a different set of technologies to succeed. These two tasks depend on each other: success in each enhances the quality of the other. Better communication through our HAN breeds better reporting to disease surveillance. Better disease surveillance allows us to deliver clear, meaningful and timely Health Alert messages.**

**Let me present how we've implemented these two systems in our state.**

**Just briefly for those hear unfamiliar with the NEDSS initiative: some background.**

**There's a well established public health responsibility for monitoring a wide range of health problems. Because the critical nature of communicable disease surveillance was so widely recognized, and recent events have only served to re-inforce this belief, NEDSS prioritized the "modernization" or "automation" of communicable disease reporting. Many of the other major challenges to public health---chronic diseases, injuries,**

**environmental health problems, maternal child health----all of these areas are in critical need of the kind of overhaul our communicable disease tracking system is going through. The work we've been doing will undoubtedly hasten the revolution in these other areas.**

**The communicable disease reporting system is critically dependent on laboratories forwarding test result information to public health staff. The established system was terribly antiquated.**

**Problems included:**

**Excessive delays in reporting**

**Resource intensive**

**Disparate & fractionated tracking systems**

**Not patient centric**

**This (slide) shows the current reporting form used by most of the laboratories in our state.**

**Once received, these forms are photocopied and shared with various offices within the agency depending on the kinds of diseases reported on the form. The pediatric lead program gets a copy if there are lead reports, the tuberculosis program gets a copy if there are tuberculosis reports, etc. There's an incredible amount of paper-shuffling, inefficiencies and delays. The data are tracked on disparate stand alone systems, none of which are integrated.**

**The national laboratories forward us a copy of the lab report that contains a reportable disease. This slide is emblematic of the problem (slide):**

**These are examples of the kinds of problems the NEDSS project set out to address.**

**It was three years ago, right around this time, when the first request for proposals for electronic disease surveillance projects was issued by CDC. The vision elaborated in that RFP is beginning to bear fruit. We were very pleased to offer Nebraska as an initial implementation site for the NEDSS base system. Nebraska offered a setting (slide) where the prospect for an early success was more likely. We have a population of 1.7 million and currently three public health entities with responsibility for communicable disease tracking. We were a couple of years in to a similar IT project involving our public health laboratory: the ordering of lab tests and delivery of test results over the internet. This gave us literacy with many of the NEDSS concepts and architectures, and we had a feel for the challenges of implementing a project like this. The NEDSS effort required a more complex partnership (slide): CDC, the Computer Science Corporation, disease surveillance and control programs at the state and local level, and our public health laboratory. This is a great point to pause and thank each of you for your dedication and support. This project is the work of a large number of persons many of whom sacrificed greatly to get to this point.**

**This timetable (slide) shows the evolution of the NEDSS project. We submitted our first NEDSS grant in July of 2000. In August of 2001 we began implementing the NEDSS base system. In January 2002, we began installing and testing various components of this**

**system. In January 2003, we went live with 3 modules: hepatitis, vaccine preventable diseases, and meningitis. One week ago, we went live with electronic laboratory reporting from LabCorp, a major national laboratory.**

**7/2000: first NEDSS grants**

**8/2001: begin NBS installation**

**1/2002: first NEDSS components installed**

**1/2003: go-live: 3 program-area modules**

**5/2003: go-live: electronic laboratory reporting**

**Just to give a quick demonstration of what the system looks like.**

**We access the system through a single sign on (slide) that controls access to all of our PHIN applications (NEDSS, HAN, and PHLIP). This approach was developed and integrated into our PHIN by our State Information Management Services staff. About a year ago we discovered this group was developing a state-government wide lightweight directory access protocol system, which dovetailed with our PHIN needs. Interested parties can discuss the security features of this system with one of the developers, Kevin Cueto who is here in the audience.**

**These slides are screen shots of the NEDSS base system in action. I logged on yesterday morning to find electronic lab reports queued up in my in box. Many of these had been electronically routed to a jurisdiction (one of our state or local health agency programs with responsibility for addressing the positive test). Others awaited manual routing. The electronic reporting from external laboratories has been live for just about a week and we're initiating a quality improvement cycle to determine why such records failed the automatic routing process, and to rectify the problem. Opening up one of these records shows the various items from the lab test that have populated the NBS. The reviewer of this record is a phone call and a click away from initiating an investigation into the circumstances surrounding this positive test: the disease detective work that is the specific task of public health.**

**This slide also demonstrates a Program Area Module: a system for collecting epidemiologic data specific to a particular disease. The success of these initial PAMs has whetted our appetite. We need more PAMs so we can begin the mothballing of the myriad legacy systems that NEDSS was designed to replace.**

**What does this system give us?**

**All of our reportable diseases reside in a single database.**

**All collaborating agencies work off of that database.**

**Multiple reports from one individual are linked to that individual**

**Access to records is controlled based on role and jurisdiction.**

**Laboratory reports are electronically messaged to the database**

**Data from lab reports initiate an electronic disease investigation report**

**Completed/validated records are electronically forwarded to national partners**

**While awaiting the electronic data feed, we've been manually entering this data (slide). The electronic laboratory data is complete in away that we could only dream about with our paper reporting (slide). There are significant challenges ahead. These include:**

#### **Series of Slides**

**We've spent a disproportionate amount of effort on getting all of these pieces to fit together and operate according to plan. We need to focus new energies on using the system to do a better job of public health. We'll know NEDSS is really starting to deliver when we see raw electronic data such as this antibiotic susceptibility report transformed into useful tables, graphs, and maps that help us better understand the health of the public.**

**While there's still work to do----we're on Version 1 here, and all of the functions of version 1 aren't there yet----the accomplishments to date validate the vision and encourage us to move ahead.**

**Our NEDSS (National Electronic Disease Surveillance System) addresses our need to get information from "out there" that permits the assessment of the population's health status. Right now we're focused on communicable diseases. This conference is filled with sessions that address the application of this model to the other areas of concern to public health: maternal child health, environmental health, chronic diseases, injury, vital records, etc. The paradigm is the same for all of these areas.**

**++++++HAN++++++**

**Our rapid development of a health alert network had its beginnings in the events surrounding the anthrax attacks in the Fall of 2001. At that time we realized our extreme need to deliver information and advice to a variety of groups in our state. The content of this information varied greatly, depending on the target audience. One size didn't fit all. Key among these target groups were physicians.**

**We had access to a database of physicians, derived from our licensure database, and enhanced by the Health Professions Tracking Center at the University of Nebraska. We give this group our licensure data, and they create added value by authenticating the data, including postal address, phone, fax, and e-mail address. There's between two and three thousand physicians in the database.**

**In late October 2001, I literally searched for "blast fax" on Google, and identified a company in New Jersey that services brokers and others in the financial industry. I e-mailed them a Microsoft Excel spreadsheet of about 1500 Nebraska primary care physicians with their specialties and fax numbers, and attached a MS Word document with information and recommendations. This company had it delivered from New Jersey back to doctors across Nebraska in a matter of about an hour.**

**Once we received Focus Area E monies from our BT grant, we immediately launched into developing our own system. The blast fax system used during the anthrax crisis helped**

clarify expectations.

A work group coalesced that put the project on a fast timeline. We began in June of 2002, and had an operational system by December 1, 2002. --slide--

**Specifications:**

**Internet-accessible**

**Secure**

**Output: 700-1000 one-page faxes/hour**

**Expandable as directory content increases**

**Fax and e-mail capable**

**Compliant with BT IT specs/phDIR**

We benefitted by working with our Information Management Services group in our Department of Administrative Services, which oversees IT issues for all of state government. As we approached them with this project they were simultaneously approached by a group from Workers Compensation Court who needed a similar system. This collaboration---both groups had short timelines for implementation---really benefitted the project and kept it on schedule.

Since the system became operational in December it's been heavily utilized: smallpox vaccine issues, SARS, etc, largely as a conduit for health alerts reaching us from the Federal level. It's real utility might best be seen in some of the less publicized issues we've faced. About two months ago I was contacted by an EIS officer in the Division of Global Migration and Quarantine. It was about 3:30 on a Friday. The concern was a report of unexplained renal failure in Sudanese refugees in Nebraska. These are always challenging problems. The story wasn't very well substantiated, no reporting source was identified, the problem just didn't seem able to compete for our time and resources. In the past this kind of a query or warning probably wouldn't have gotten much of a response out of us. Access to our health alert network system changed everything. ---slide---

**(SLIDES)**

**accessed our portal**

**pulled up our HAN application**

**selected all nephrologists in all counties**

**composed a brief note on word processor**

**attached the document**

**hit the send button**

**call forwarded phone to cell phone**

**went home!**

By the close of business on Monday, I had learned of three such cases, all with natural explanation for their renal failure. No outbreak, no "acute" public health problem. But the right thing was done, a potential problem was addressed. This could have been real. There are plenty of real public health problems analagous to this that don't get addressed in a timely fashion, if at all, because, lacking tools such as this, we just don't have the

resources. Some of these oversights have consequences.

About a month later I heard back from this doctor.

The grasp of infectious disease reflected in this doctor's e-mail query underscored the critical role of our HAN and other public health communication tools in educating key public health partners. It's clear, initiatives like our Health Alert Networks are changing who we are, how we do business, and their contributing to how we're perceived by our key public health partners.

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Like our NEDSS project this is a version one system. We're working on enhancements, including:

- 1) the ability to self-register
- 2) the ability to conduct surveys: the nephrologists in my example could have been asked to go to the web and complete a survey;
- 3) extending access to the HAN to key partners, such as county health agencies, who will be able to use the HAN to communicate within their jurisdictions. We see this as a real value added, by using role and jurisdiction of an end user and of entrees in the directory to enable/restrict access to the system: all of the developed HAN infrastructure, including the directory content, supplants the need for a duplicate project
- 4) the incorporation of GIS to define a target group. Not all problems are organized by county boundaries. The GIS dimension will give us the ability to more precisely target messages.

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Key challenges for our HAN:

#### Challenge #1

Identifying our partners

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We have an expansive list of partners. For each one of these groups I could provide an example of an important if not critical need to communicate with as a group with a group-specific message---in the past 12 months.

Public Health Staff

Physicians

Hospitals

    Infection control

    Laboratories

    Emergency room

    Respiratory therapists

Veterinarians

Pharmacists

**Law enforcement**  
**Occupational Health Nurses**  
**School Nurses**  
**School Principals**  
**Media**  
**Nursing homes**  
**Municipal leaders**

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### **Challenge #2**

#### **Organizing our directory content**

The tabs, search functions, and overall organization of this page should probably be very much the same from jurisdiction to jurisdiction. What is the optimal way to organize/classify these groups. There's a need for a standard and a standard-setting body.

How do we classify an Emergency Medical Technician, vs a Paramedic vs an Ambulance Attendant vs a fireman? There's a very interesting concurrent session on Wednesday afternoon that addresses this important issue.

### **Challenge #3**

#### **Need for administrative rules**

Questions like who can use this directory, what kinds of editorial standards should be applied to the content. Two weeks ago a fax went out with my name on it without my having previewed/edited it. There's probably a need for an advisory body, with representatives of at least some of the groups in the directory, to provide some oversight and guidance.

### **Challenge #4**

How to collect/maintain quality directory content? There'll probably be a range of solutions to collecting good directory content, from self-registration, to active surveying, to sharing of membership lists. Many groups maintain their own directory content and are happy to give it to HAN. Can we set standards for the quality of their directory content, and can we standardize the exchange of directory content? Do we need to partner with the telephone directory folks?

There's a phenomenal public health benefit to having the HAN infrastructure and the directory content that facilitates good communication. To do so clearly requires serious resources.